REMARKS

Claims 1-4, 7, 9-15, and 18-30 are pending in the present application. Claims 21-30 are withdrawn from consideration, and claims 1-4, 7, 9-15 and 18-20 have been examined. Applicants appreciate the examiner's indication that claim 15 would be allowable if rewritten in independent form. Claims 1-4, 7, 9-14 and 18-20 stand rejected. Applicants address the present action as follows.

Claim 19 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Specifically, the examiner indicates that the term "composite frame" is unclear. In response, applicants amended claim 19 to clarify that the composite frame is a frame predicted from both the short term and long term frame memories. Accordingly, withdrawal of the rejection is requested.

Claims 1, 4, 7, 11, and 19-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fukuhara et al. ("Very Low Bit-Rate Video Coding with Block Partitioning and Adaptive Selection of Two Time-Differential Frame Memories"). Applicants traverse this rejection.

Fukuhara discloses that step 1 of a motion compensation procedure includes encoding three predicted macroblocks: PMB(S) using a short term frame memory, PMB(L) using a long-term frame memory; and PMB(IP) using an interpolation of PMB(S) and PMB(L), and determining which of the predicted macroblocks has the lowest absolute error (see Fukuhara, p. 216). Similarly, step 2 of the motion compensation procedure disclosed in Fukuhara involves performing block-partitioning motion compensation. The block-partitioning motion compensation involves dividing

8

macroblocks created using the short-term frame memory and the long-term frame memory into portions, and then combining the portions of the divided macroblocks to form a single macroblock (see p. 216). A macroblock having the lowest absolute error value is selected as a result of the block-partitioning motion compensation. Then, the absolute error values calculated in steps 1 and 2 are compared, and the prediction method (i.e., motion compensation or block-partitioning motion compensation) corresponding to the lowest absolute error value is selected as a prediction method for the encoding. Fukuhara teaches that the absolute error value is used to select between one of motion compensation and block-partitioning motion compensation, regardless of whether the short-term frame memory, the long-term frame memory or some combination of the short and long term frame memories will be used for the selected prediction method. Moreover, the method choices presented may not include an option that uses the long-term frame memory and an option that uses the short-term frame memory.

In contrast, claim 1 recites that a coder selectively chooses between encoding with respect to the at least one short term reference block in the short term reference block buffer and the at least one long term reference block in the long term reference buffer based upon one or more factors examined at the time of encoding to improve one of compression, video quality, and a metric balancing compression and video quality. Since Fukuhara fails to disclose or suggest such a feature, withdrawal of the rejection of claim 1 and its associated dependent claims is requested.

Regarding dependent claim 7, as discussed above, Fukuhara discloses that a prediction method is selected based on an absolute error value. In contrast, claim 7 of the

present application recites several factors that may be examined at the time of encoding, including the encoder's expectation of distortion at a decoder, a number of frame buffers in the encoder, the size of frame buffers in the encoder, any feedback from the decoder, a history of changing data channel quality, and a history of the changing image region quality. However, an absolute error value is not one of the factors recited in claim 7. Further, as discussed above, claim 7 recites that the one or more factors are used to selectively choose, for each at least one block being encoded, between the at least one long term reference block and the at least one short term reference block. On the other hand, the comparison in step three of Fukuhara selects between standard motion compensation and block-partitioning motion compensation as a prediction method without regard for whether the selected method uses the data in the short-term frame memory, the data in the long-term frame memory, or some combination of the two memories. For these reasons, applicants again request withdrawal of the rejection of claim 7.

Claims 2 and 3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fukuhara in view of Applicants' Admitted Prior Art (hereinafter, "AAPA"). Claims 2 and 3 depend from independent claim 1. Thus, the claims incorporate the features of independent claim 1, plus additional features. Accordingly, applicants traverse the rejection of claims 2 and 3 for the reasons discussed above regarding the rejection of independent claim 1, and because AAPA fails to remedy the deficiencies of the rejection of independent claim 1. For these reasons, withdrawal of the rejection of claims 2 and 3 is requested.

Further, Fukuhara discloses that a prediction mode that yields a lowest absolute error is selected as a motion compensation mode (see Fukuhara, Fig. 8, step 3). That is, the motion compensation mode may make use of the short-term frame memory, the long-term frame memory, or a combination thereof using block partition motion compensation. AAPA discloses retaining multiple frames and searching all retained frames to determine a best match when a connection used to transmit video data suffers a change in quality (see Present Specification, p. 3, lns. 7-20). Accordingly, the combination of Fukuhara and AAPA merely discloses selecting the one of the multiple retained frames that yields a lowest absolute error when the transmission quality of video data is changed. Such a system is computationally expensive, since error rates must be computed for each for the retained frames.

In contrast, claim 2 recites that the coder for encoding selectively chooses the at least one long term reference block when a connection used by the video encoder changes to a lower quality. Similarly, claim 3 recites that the coder for encoding selectively chooses the at least one long term reference block when a connection used by the video encoder is anticipated to be changing to a lower quality. This choice advantageously reduces the computational expense of choosing a reference block, since it is not necessary to test each of the stored reference blocks to determine which provides the lowest error, as in the method disclosed by the combination of Fukuhara and AAPA. Since the cited references fail to disclose or suggest choosing the long-term reference block as recited in claims 2 and 3, withdrawal of the rejection of these claims is again requested.

Claims 9, 14, and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fukuhara and Gu et al. (U.S. Patent No. 7,253,831). Claims 9, 14, and 18 ultimately depend from claim 1, and thus incorporate the features of claim 1, plus additional features. Accordingly, applicants traverse the rejection of dependent claims 9, 14, and 18 for the reasons discussed above with respect to the rejection of claim 1, and because Gu fails to remedy the above-identified deficiencies of the rejection. For this reason, applicants request withdrawal of the rejection of claims 9, 14, and 18.

Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Fukuhara in view of Liu et al. (U.S. Patent No. 5,398,079). Claim 12 ultimately depends from independent claim 1. Accordingly, claim 12 includes all the features recited in independent claim 1. Applicants traverse the rejection of claim 12 for the reasons discussed above regarding the rejection of claim 1, and because the Liu fails remedy the deficiencies identified regarding the rejection of claim 1. For at least this reason, withdrawal of the rejection of claim 12 is requested.

Claim 13 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Fukuhara in view of Liu and Zhang et al. ("Video Coding with Optimal Inter/Intra-Mode Switching for Packet Loss Resilience"). Claim 13 ultimately depends from claim 1, and thus incorporates the features of claim 1, plus additional features. Accordingly, applicants traverse the rejection of dependent claim 13 for the reasons discussed above with respect to the rejection of claim 1, and because Liu and Zhang, separately or when combined with Fukuhara, fail to remedy the above-identified deficiencies of the rejection of claim 1. For this reason, applicants request withdrawal of the rejection of claim 13.

Finally, new claim 31 has been added. New claim 31 depends from claim 1, and is thus allowable for at least the reasons discussed above with respect to claim 1. Applicants respectfully request consideration and allowance of new claim 31.

For all the foregoing reasons, applicants submit that this application is in condition for allowance, which is respectfully requested. The Examiner is invited to contact the undersigned attorney is an interview would expedite prosecution.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By   /Kevin T. Bastuba/
      Kevin T. Bastuba
      Registration No. 59,905

November 3, 2010
300 South Wacker Drive
Suite 2500
Chicago, Illinois 60606
(312) 360-0080
Customer No. 24978